

5. Hannah

Program Name: Hannah.java

Input File: hannah.dat

Hannah knows there's most likely an arithmetic question on the written portion of the UIL Computer Science test, that most likely is not going to be in decimal (base 10). Hannah has the idea to write a program that will perform simple arithmetic, either addition, subtraction, multiplication or division on two numbers in a given base. This way, Hannah can make up her own sample questions, and check to see if she computed the correct answer. Can you help Hannah with this?

Input: Input begins with an integer N ($1 \leq N \leq 10$), the number of different test cases. Each of the following N test cases will consist of two lines. The first line will be an integer B , the base of the numbers to be given as well as the base for the arithmetic. The base B will be in range $[2, 16]$. The second line will contain two operands, $op1$ and $op2$, separated by an arithmetic operator, s . The input will be formatted as seen in the sample input. The operands will be guaranteed to be valid integers for the given base B and will be in range $[-B^8, B^8]$. The operators will either be: $+$, $-$, $/$, or $*$.

Exact Output: For each test case you are to output: $op1 \ s \ op2 = \text{resultant}$, where $op1$ is operand 1, s is the sign, $op2$ is operand 2, and resultant is the arithmetic result of the arithmetic performed in base B . The resultant should be of type integer and all mathematical operations are of type integer. If a letter is needed to represent the resultant, use only capital letters.

Sample Input:

```
7
10
10 + 15
2
1010 - 1111
4
31 * 1123
16
2E / F
7
123456 + 654321
3
2212 / 12
2
11111111 - 11111111
```

Sample Output:

```
10 + 15 = 25
1010 - 1111 = -101
31 * 1123 = 102133
2E / F = 3
123456 + 654321 = 1111110
2212 / 12 = 120
11111111 - 11111111 = 0
```